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Raindrops Keep Falling on my Head

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**UCSB**

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# The Network Weather Service and the NASA Information Power Grid

*Rich Wolski*

UC Santa Barbara

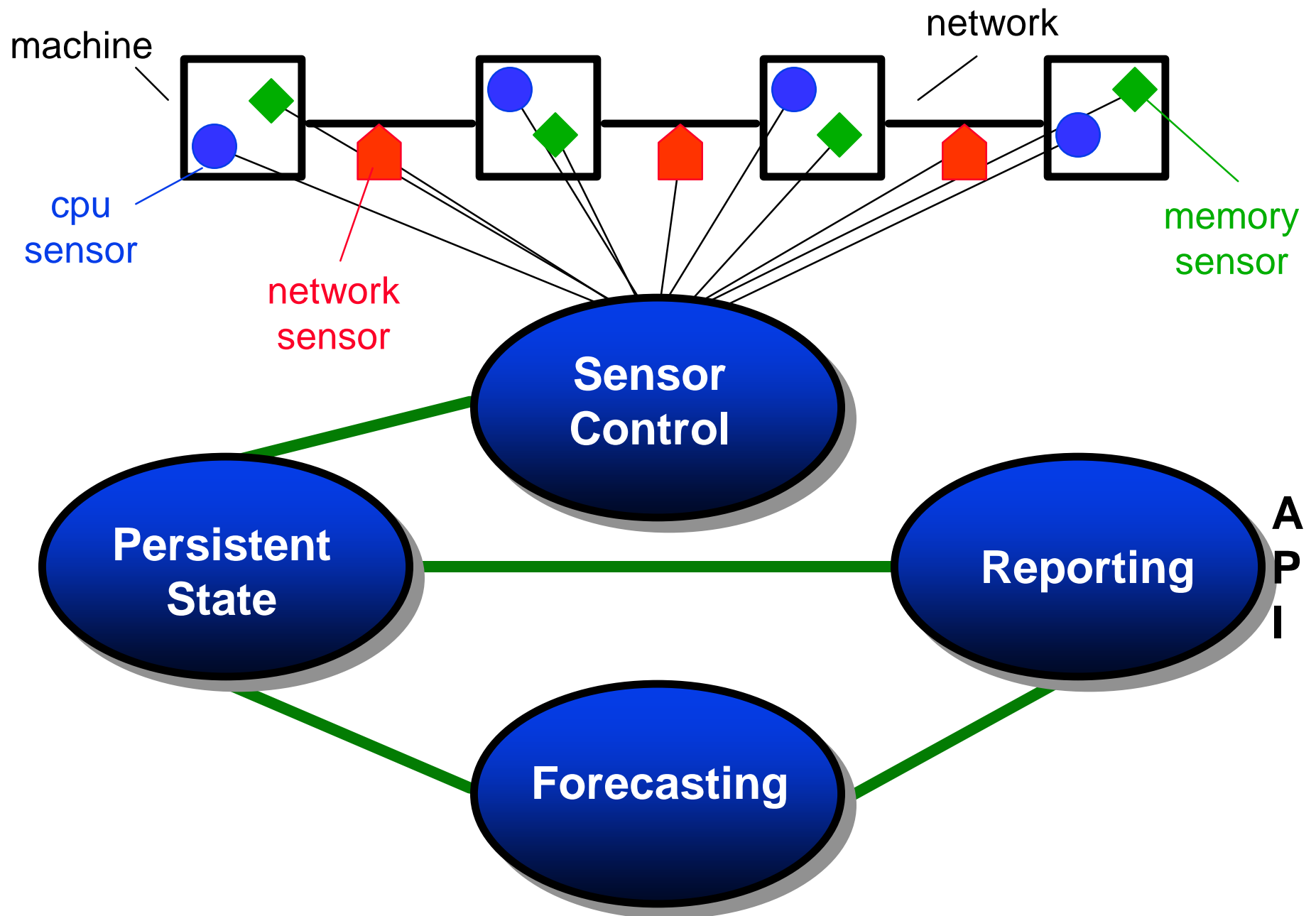
# Outline

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- System Features
- Performance Tuning
- Forecasting the Immediate Future

# Logical Architecture

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# Important Questions for any Monitoring System

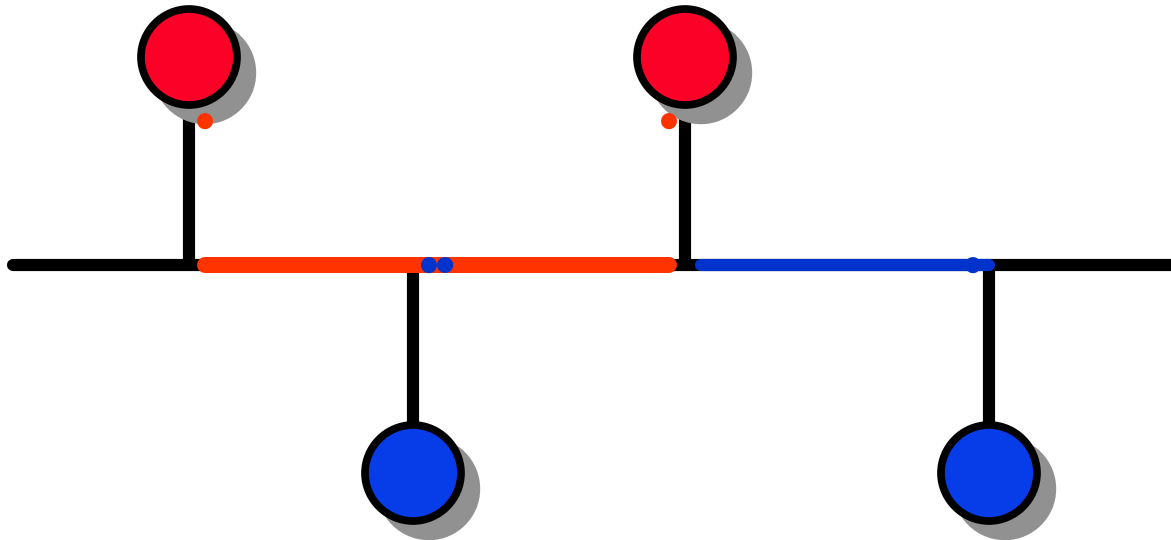
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- *How accurate are the measurements?*
- *How intrusive are the measurements?*
- *What is the performance?*

# Probe Contention

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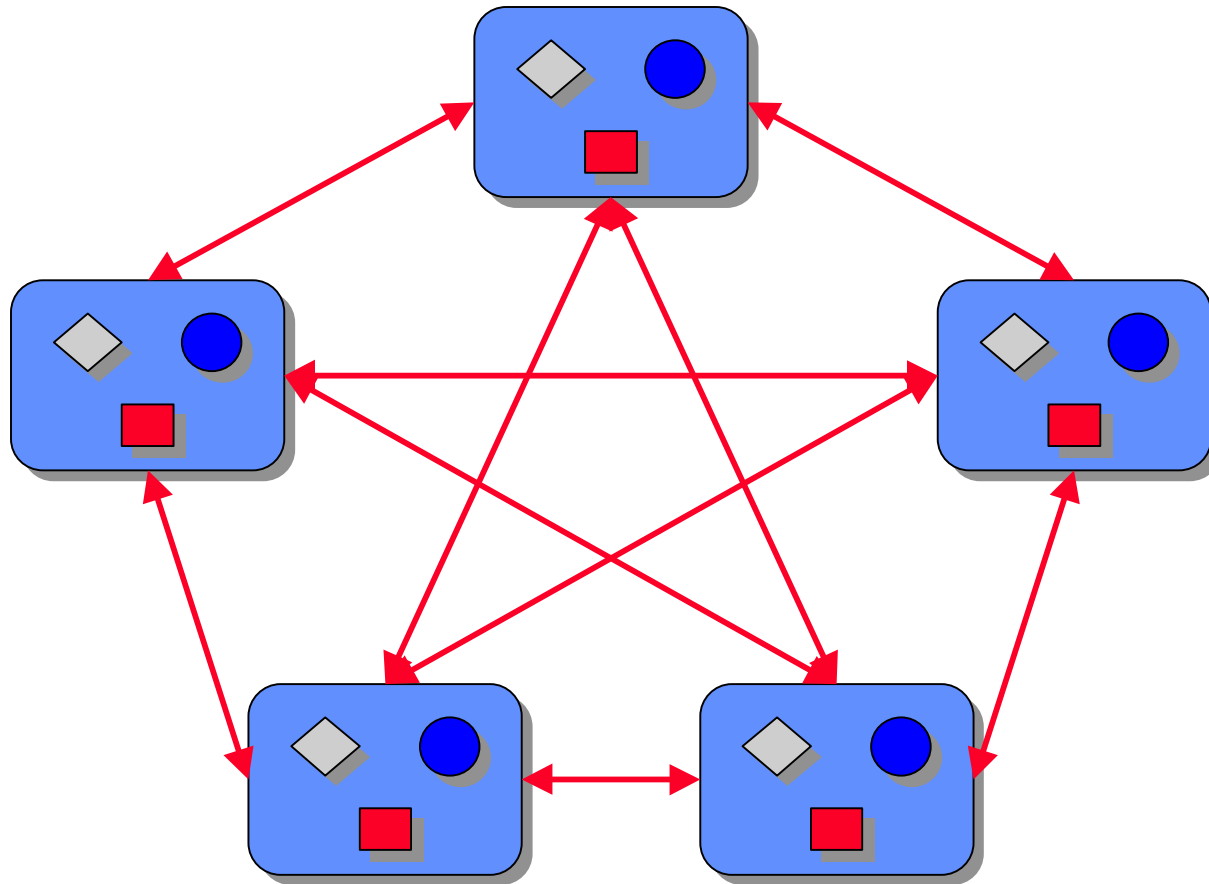
- Simultaneous probing of shared resources causes measurements to be biased by self-contention.



- Probes cannot be run on **local clocks** and must be coordinated => **mutual exclusion**.

# Clique Protocol

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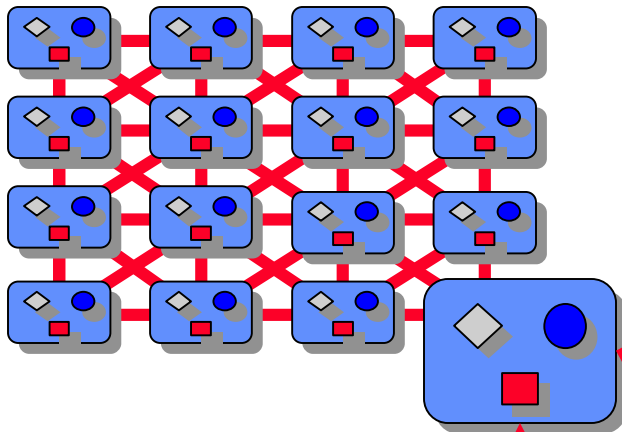


- Cliques of hosts pass a token to decide when to measure network performance
- Distributed leader-election protocol

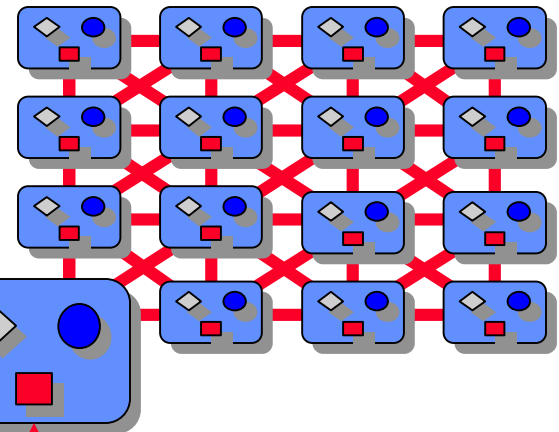
# Scalability

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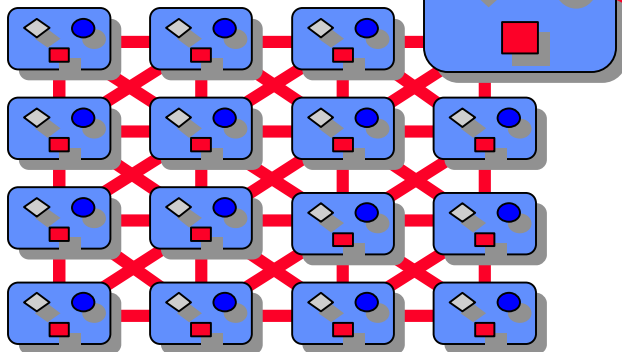
ISI



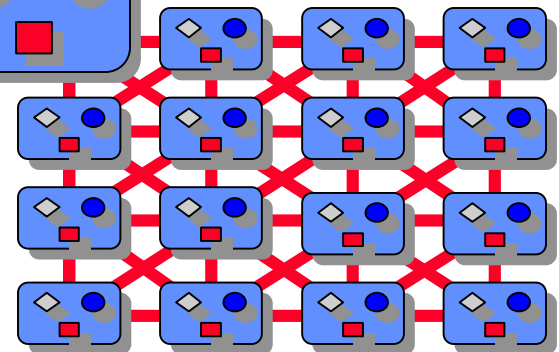
UCSB



NASA



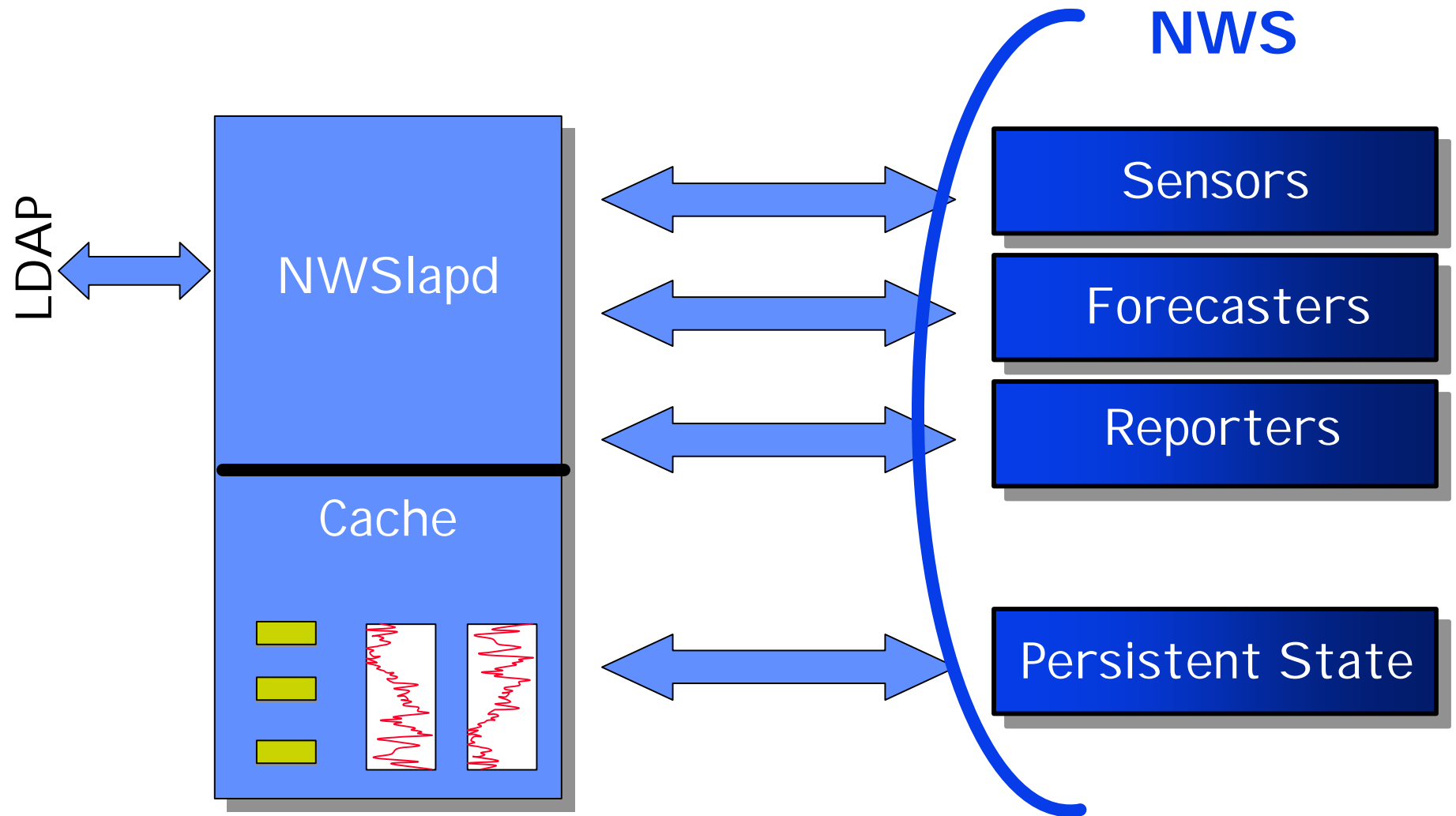
SDSC





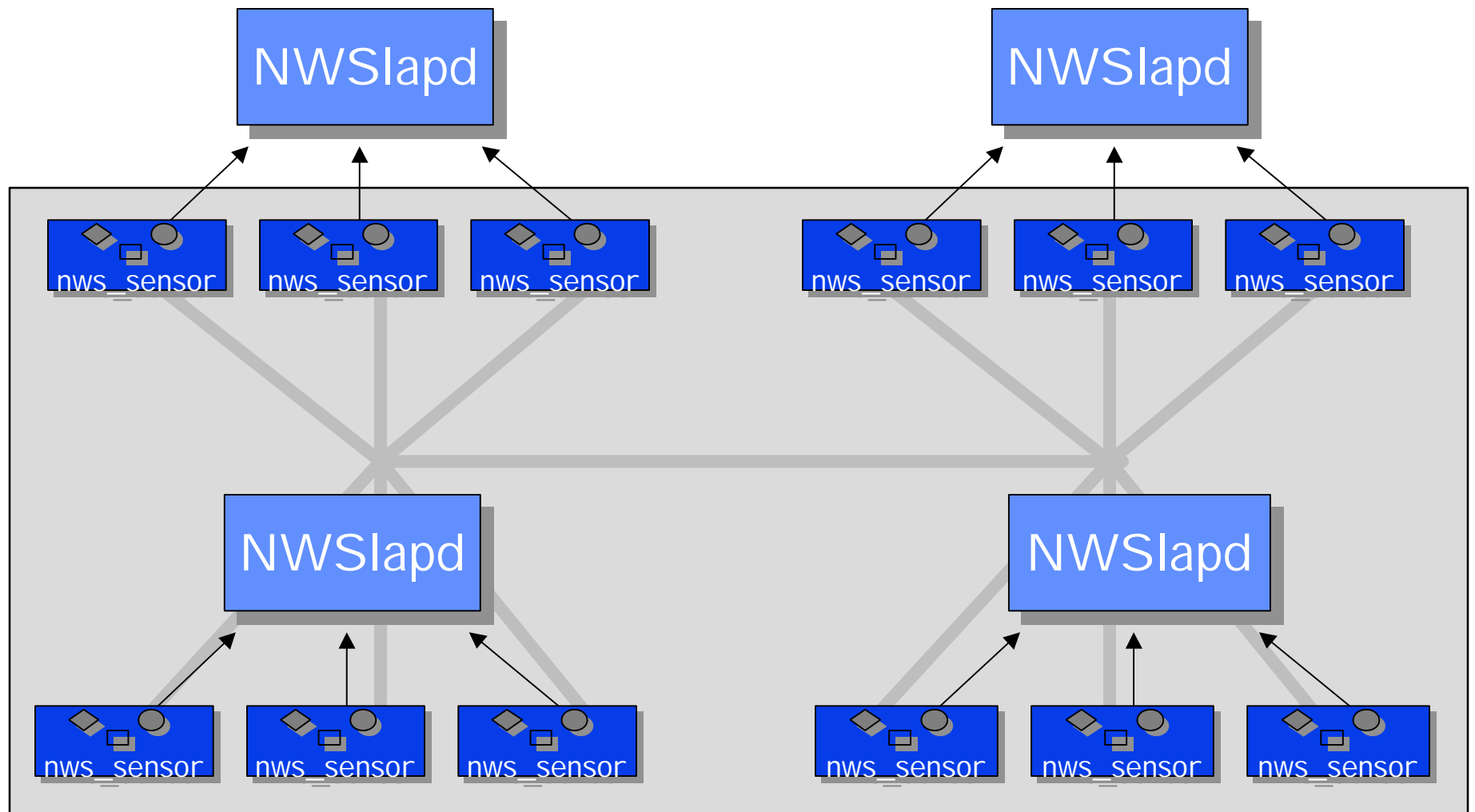
# Scalable Performance – Caching Servers

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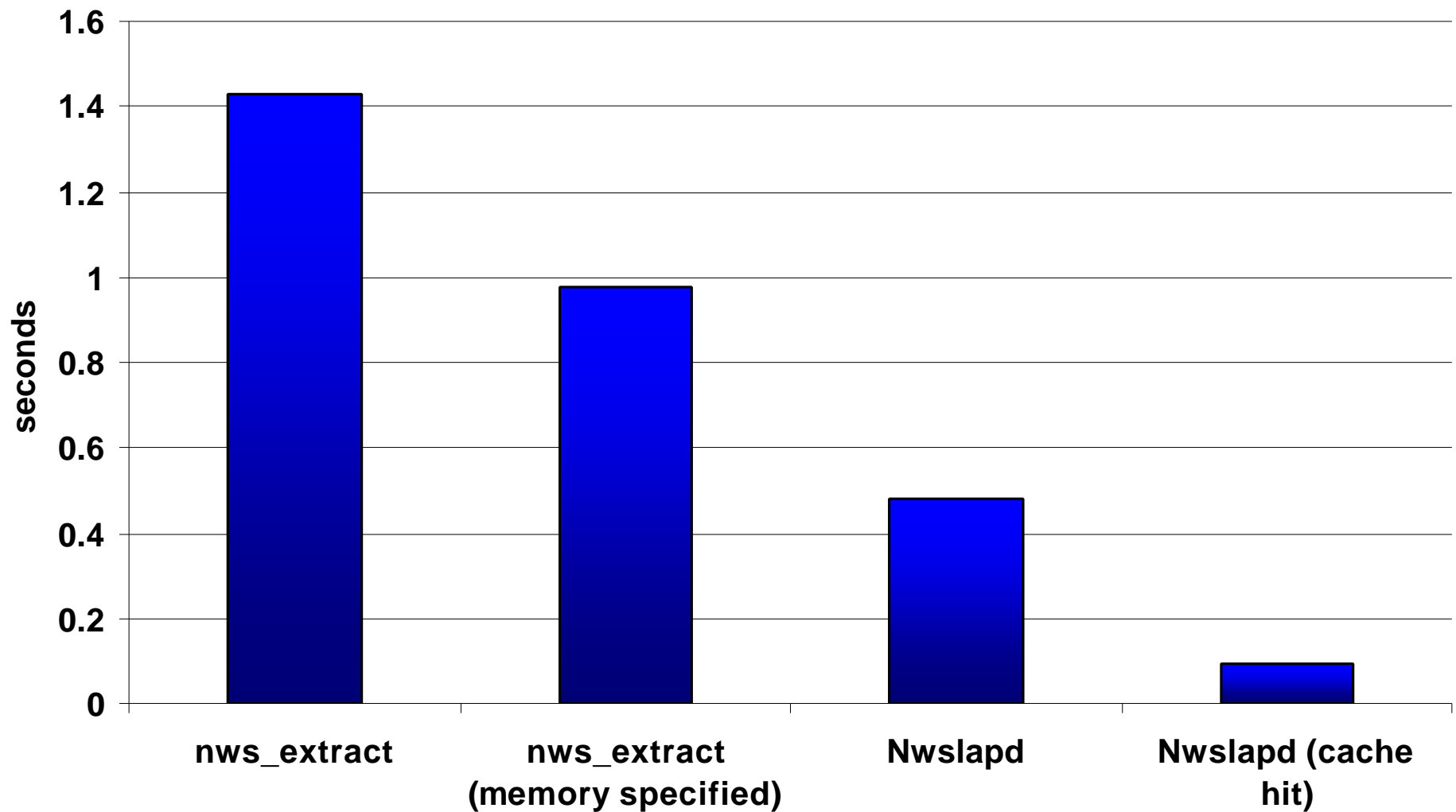
# Servers are Replicated

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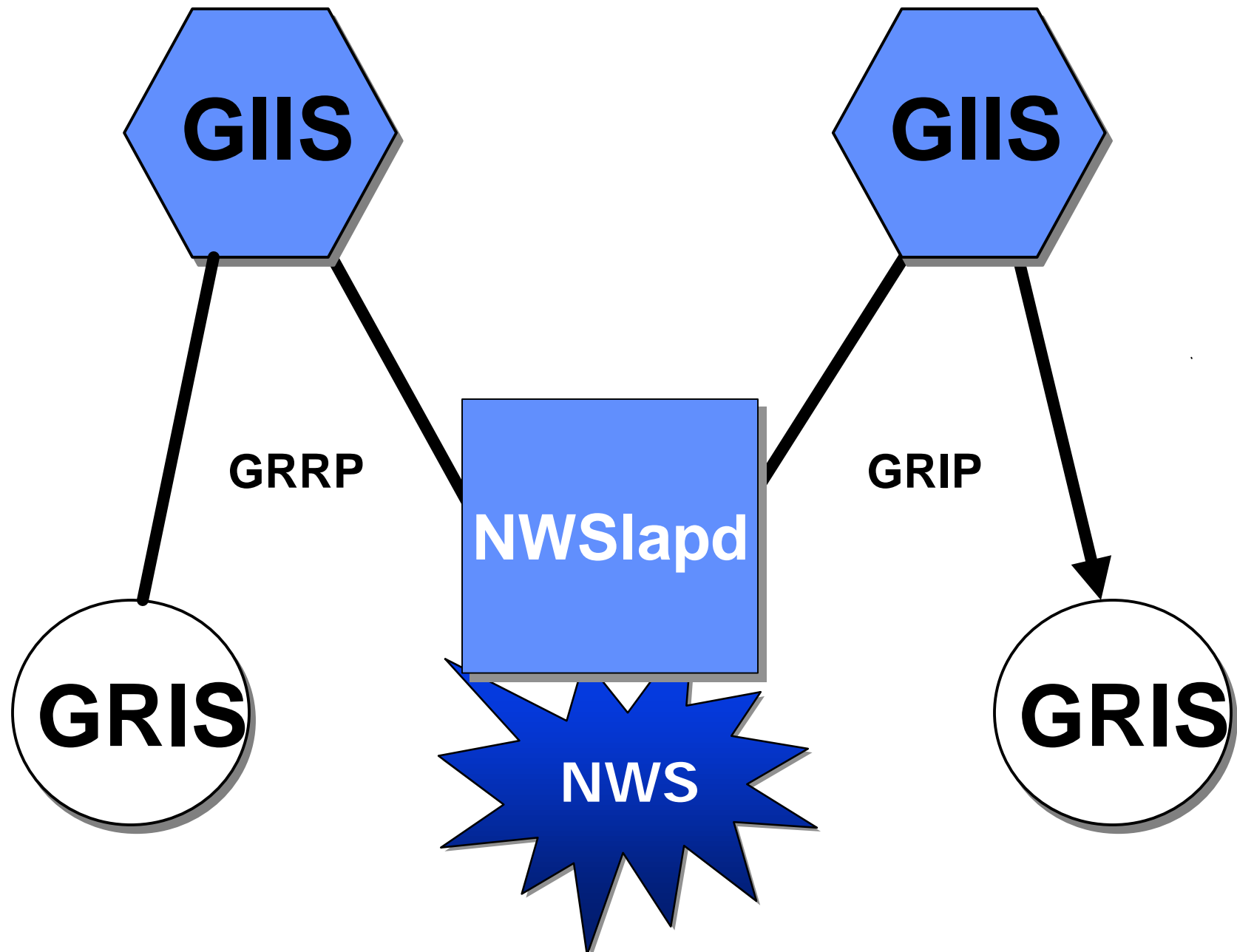
# NWS Fetch times

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# The NWS, The GIS, The GMA, and GGF

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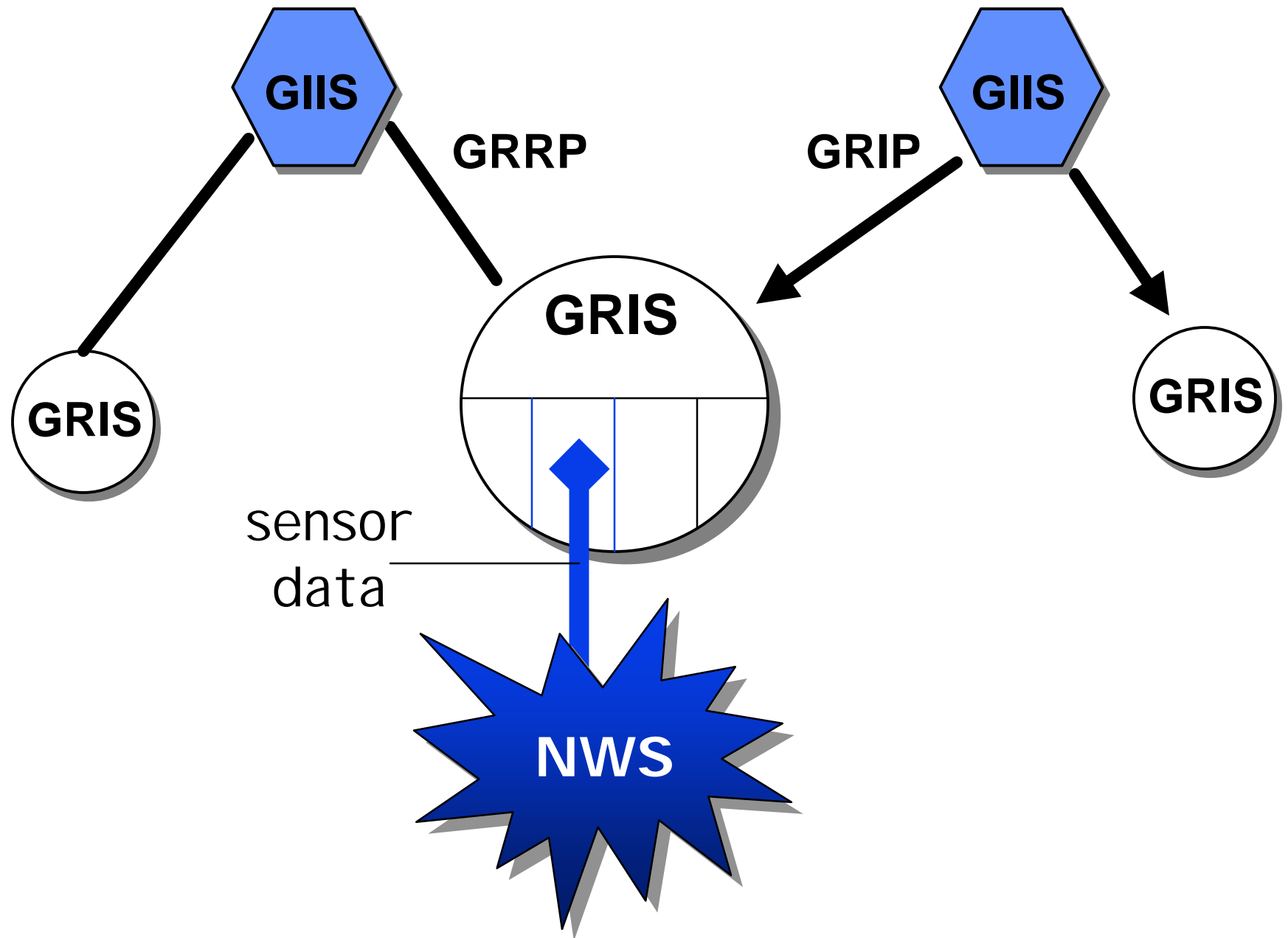
## Next Year in Review

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- **Packaging and Configuration**
  - NWS will use the MDS-2 as a name service
  - Globus packaging and deployment
  - One-button install and configure
- **NWS-DB**
  - Relational database archive of performance data
  - Conforms to both GMA and GIS architectures and implemented with Globus
  - Prototype at SC01
- New **sensor registration and integration interfaces**
  - Improves extensibility
  - Thread-safe messaging
  - Better, cleaner, cheaper, less-filling, ...
- Long-range **forecasting**

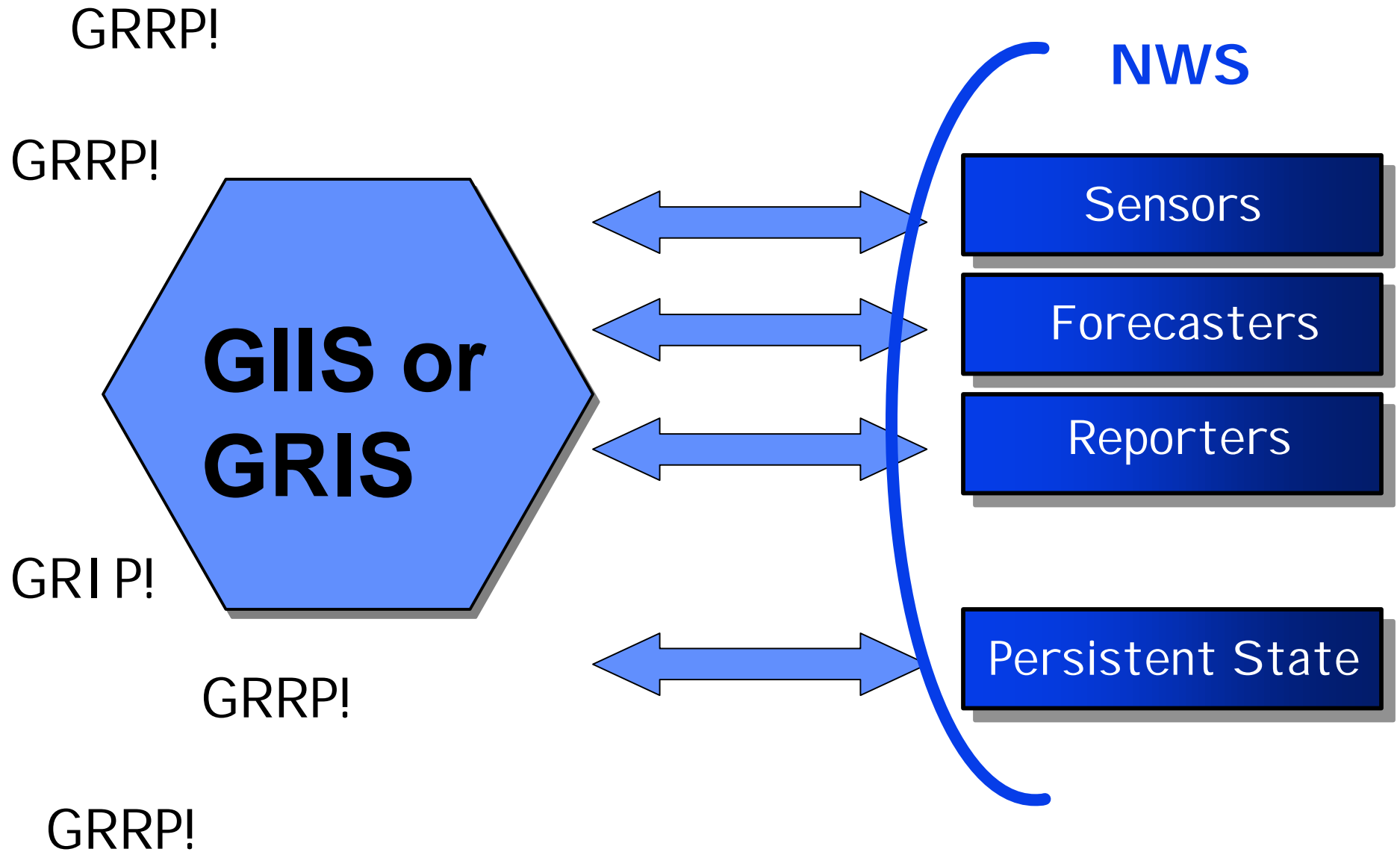
# NWS using the MDS-2

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## ... It's Also a Client

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## Summing Up...

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- The performance of the **NWS** is greatly improved
  - The performance of the middleware services for dynamic data really does matter
- The **NWS** conforms to both the **GIS** and **GMA** recommendations and pronunciations from the GGF
  - User-community continues to grow
- We are focusing on **packaging**, **configuration**, and **extensibility**
  - Globus GPT
  - One-button install (debian, NPACI rocks, RPM)
  - NMI release 1.0
- New **forecasting** research will be folded in



## A Few Changes

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- The **NWS** Project staff and students  
Martin Swany, Graziano Obertelli,  
Matthew Allen, Wahid Chrabakh,  
Imran Patel, Vladimir Veytser

<http://nws.npaci.edu>